

Patent Claims

1. Hand tool for the assembly of small, notably electronic components, with a shaft (10) provided with a handle (11) and with a head part (12) in which is mounted a spindle (27) housing a vacuum tool (13), said spindle being adjusted by means of rotation using a turning knob (40), where the axis of the spindle or vacuum tool (C) forms a constant angle to the axis of the shaft (B), with an electropneumatic connector (14) between the vacuum tool (13) and an external control device (5) for switching the vacuum on and off, and with a switch device (55, 57) to pass a signal to the control device (5), characterised in that the axis of the turning knob (D) is located at a distance with respect to the axis of the spindle or the vacuum tool (C) respectively and is offset towards the hand grip (11), where a driving connection (44, 46, 45) exists between the turning knob (40) and the spindle (27).
2. Hand tool according to Claim 1, characterised in that a drive wheel (44) connected to the turning knob (40) is connected via an intermediate wheel (46) to a spindle wheel (45) connected to the spindle in a driving connection, where the individual wheels are preferably in the form of meshing, straight-toothed spur wheels.
3. Hand tool according to Claim 2, with a spindle (27) in the head part (12) which can be displaced axially when the component to be handled is touched with the vacuum tool (13), characterised in that the spindle wheel (45) connected to the spindle (27) forms part (57) of the switching device (55, 57) for passing a signal to the control device (15).
4. Hand tool according to Claim 3, characterised in that the spindle wheel (45) connected to the spindle (27) forms one contact (57) of a mechanically actuated contact pair (55, 57).
5. Hand tool according to Claim 3, characterised in that the spindle wheel (45) connected to the spindle (27) forms part of an electronic sensor.
6. Hand tool according to one of Claims 1 to 5, with a flexible link (15), extending between the shaft (10) and the control device (5), of the electropneumatic link (14) between the vacuum tool (13) and the control device, characterised in that the flexible link (15)

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7. Hand tool according to Claim 6, characterised in that the tube (66) forms a vacuum channel (67) through which the electrical wires, preferably in the form of an insulated flex (53) and an uninsulated cable (54), preferably made of steel, are guided.
8. Hand tool according to Claim 7, characterised in that the tube (66) is manufactured from silicon with added graphite.
9. Hand tool according to one of the claims 6 to 8, characterised in that the flexible link (15) can be connected via an electropneumatic connector (17) with the control device (5) which displays both pneumatic as well as electrical connection elements (77, 78; 70).
10. Hand tool according to Claim 9, characterised in that the cable (54) is permanently anchored, firstly to the shaft (10) and secondly to the electropneumatic connector (17).
11. Hand tool according to one of claims 1 to 10, characterised in that the shaft (10) is provided with means (2) for mounting the hand tool (1) in a holder (3), preferably placed on a housing (4) of the control device (5) when not in use.
12. Hand tool according to Claim 11, characterised in that this means consists of an end piece (2) of the shaft (10) with an extended cross-section, with which the hand tool (1) can be mounted in a fork-shaped holder (3) which can be fixed into an ideal ergonomic position.

8. Hand tool according to Claim 7, characterised in that the tube (66) is manufactured from silicon with added graphite.

9. Hand tool according to one of the claims 6 to 8, characterised in that the flexible link (15) can be connected via an electropneumatic connector (17) with the control device (5) which displays both pneumatic as well as electrical connection elements (77, 78; 70).

10. Hand tool according to Claim 9, characterised in that the cable (54) is permanently anchored, firstly to the shaft (10) and secondly to the electropneumatic connector (17).

11. Hand tool according to one of claims 1 to 10, characterised in that the shaft (10) is provided with means (2) for mounting the hand tool (1) in a holder (3), preferably placed on a housing (4) of the control device (5) when not in use.

12. Hand tool according to Claim 11, characterised in that this means consists of an end piece (2) of the shaft (10) with an extended cross-section, with which the hand tool (1) can be mounted in a fork-shaped holder (3) which can be fixed into an ideal ergonomic position.

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